September 21, 2005

David H. Meyer
Acting Deputy Director
Office of Electricity Delivery and Energy Reliability
U. S. Department of Energy
Washington, D.C. 20585

RE: Economic Dispatch in Electricity Industry

Dear Mr. Meyer

In response to your letter dated September 1, 2005, to Mr. David Owens with Edison Electric Institute (EEI), CenterPoint Energy Houston Electric, LLC (CenterPoint Energy) submits the attached responses. CenterPoint Energy is an unbundled Transmission and Distribution utility owning no generation or generation affiliate, operating within the Electric Reliability Council of Texas (ERCOT). As such, CenterPoint Energy's comments are limited to transmission planning aspects of economic dispatch.

Dispatching generating units in an economically efficient manner clearly has economic advantages over dispatching generating units in an uneconomic manner. CenterPoint Energy is neutral on whether industry changes are necessary or advisable to facilitate economic dispatch. Regardless of whether industry changes are necessary or advisable, transmission constraints upon economic dispatch can cause uneconomic dispatch. Transmission constraints will occur unless such constraints are anticipated by transmission planners and appropriate plans are developed and implemented.

Mr. Paul Rocha, Department Manager of Transmission Planning, will be able to respond to questions concerning the responses. His telephone number is 713-207-2768. For any other related correspondence concerning this matter, please contact:

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Thank you for the opportunity to respond to the questions presented to EEI. If you should have any questions, please do not hesitate to contact me.

Yours truly,

DeAnn T. Walker
Senior Counsel

Response to Questions to Stakeholders

1) *What are the procedures now used in your region for economic dispatch? Who is performing the dispatch (a utility, an ISO or RTO, or other) and over how large an area (geographic scope, MW load, MW generation resources, number of retail customers within the dispatch area)?*

Response of CenterPoint Energy:

For the purposes of developing transmission planning models, the Electric Reliability Council of Texas (ERCOT), which is the Independent System Operator (ISO) for the ERCOT Region, primarily determines the commitment and dispatch of generating units. CenterPoint Energy's understanding is that ERCOT has access to generator production cost data throughout the ERCOT region, and ERCOT uses this data to develop economic dispatch patterns used for transmission planning purposes.

The ERCOT Region operates as a single control area, and ERCOT is, among other things, the control area operator. CenterPoint Energy understands that Qualified Scheduling Entities (QSEs) determine generation commitment and dispatch and schedule generating units through the ERCOT control area operators. The ERCOT Region serves approximately 85% of the electrical load in Texas and has an overall generating capacity of approximately 70,000 megawatts (MW), serving a peak load of about 60,000 MW. It is one of 10 regional reliability councils in the North American Electric Reliability Council (NERC). As a NERC member, the primary responsibility of ERCOT is to facilitate reliable power grid operations in the ERCOT Region by working with the region's electrical energy industry organizations. ERCOT is the only reliability region in North America that is located completely within the borders of a single state, and it is one of two reliability regions that are also ISOs.

There are two basic types of generation dispatch used for transmission planning purposes by ERCOT. One type is aimed at representing economic dispatch as closely as possible. This type of dispatch pattern indicates what transmission concerns and constraints will likely occur under economically efficient operation of generating units, which is how generators are most likely to operate and how consumers would like

generators to operate from an energy cost standpoint. The other pattern is a transmission constrained economic dispatch pattern. CenterPoint Energy believes this latter pattern is less valuable for transmission planning purposes because, by definition, the pattern tends to mask transmission constraints. It is problematic for transmission planners to identify transmission constraints and develop plans to address those constraints if the constraint is masked by an uneconomic dispatch pattern. Nevertheless, the constrained dispatch pattern does have some value, particularly when the constraints require long lead times to remedy, because the pattern more accurately reflects the likely short term operating condition of the grid. Generation re-dispatch to remedy a particular constraint may inadvertently cause a new constraint to appear, and the transmission constrained generation dispatch models are useful for identifying such otherwise hidden constraints.

2) *Is the Act's definition of economic dispatch (see above) appropriate? Over what geographic scale or area should economic dispatch be practiced? Besides cost and reliability, are there any other factors or considerations that should be considered in economic dispatch, and why?*

Response of CenterPoint Energy:

The Act's definition of economic dispatch is appropriate. An interconnection-wide dispatch, such as that used by ERCOT, is ideal for transmission planning purposes, but probably is not practical for larger systems, especially if there are multiple regional organizations and control areas.

3) *How do economic dispatch procedures differ for different classes of generation, including utility-owned versus non-utility generation? Do actual operational practices differ from the formal procedures required under tariff or federal or state rules, or from the economic dispatch definition above? If there is a difference, please indicate what the difference is, how often this occurs, and its impacts upon non-utility generation and upon retail electricity users. If you have specific analyses or studies that document your position, please provide them.*

Response of CenterPoint Energy:

ERCOT generally does not distinguish between utility and non-utility generation, except perhaps in areas of ERCOT that have not opted for retail energy competition. CenterPoint Energy, for example, is a structurally unbundled transmission and distribution utility serving the Houston area, owning no generation and no generation affiliate. There is no vertically integrated utility, or "utility" generation, remaining in the Houston area, so no distinction is possible for utility versus non-utility generation in the area served by CenterPoint Energy.

4) *What changes in economic dispatch procedures would lead to more non-utility generator dispatch? If you think that changes are needed to current economic dispatch procedures in your area to better enable economic dispatch participation by non-utility generators, please explain the changes you recommend.*

Response of CenterPoint Energy:

CenterPoint Energy believes qualified scheduling entities (QSEs) dispatch generating units economically within ERCOT without regard for utility or non-utility generation, except as constrained by transmission system or other limitations.

For transmission planning purposes, ERCOT developed a methodology to approximate economic dispatch for the ERCOT Region based on public domain information it assembled concerning generators, such as age, technology, and fuel type. For example, solid fuel units (nuclear, lignite, and coal) were dispatched ahead of natural gas units. Natural gas units were then dispatched by technology (cogeneration and combined cycle gas turbine units ahead of conventional steam and simple cycle gas turbine units, for example) and, within a technology type, the units were dispatched based on age (newer units ahead of older units). Later, CenterPoint Energy understands ERCOT obtained confidential generator production cost data, and now uses that data to determine economic dispatch for transmission planning purposes.

Primarily using power flow cases developed with these economic dispatch methods to plan its transmission system, CenterPoint Energy found it was able to

reasonably anticipate most future system conditions, develop appropriate transmission plans, and timely implement those plans. As a result, there is very little congestion within CenterPoint Energy's system, notwithstanding massive generation changes on CenterPoint Energy's system over the past few years. Due primarily to the compact nature of CenterPoint Energy's grid and conductor technology used by CenterPoint Energy in recent years, the lead time for CenterPoint Energy to address transmission constraints tends to be fairly short, so the constrained dispatch pattern is seldom useful to CenterPoint Energy.

Economic dispatch patterns were traditionally used by vertically integrated utilities and ideally should still be the primary dispatch pattern used for transmission planning purposes. Using economic dispatch in transmission planning models would reveal transmission constraints upon economically efficient generation and therefore enable transmission system design such that the most efficient generation units can be dispatched, regardless of whether those units are utility or non-utility owned. Where transmission planners do not have access to generation production data, an approach such as the one used by ERCOT where economic dispatch is estimated by factors such as fuel type, technology, and age of the units could be used.

5) *If economic dispatch causes greater dispatch and use of non-utility generation, what effects might this have – on the grid, on the mix of energy and capacity available to retail customers, to energy prices and costs, to environmental emissions, or other impacts? How would this affect retail customers in particular states or nationwide? If you have specific analyses to support your position, please provide them to us.*

Response of CenterPoint Energy:

As its name implies, economic dispatch is more economic than uneconomic dispatch, and therefore should result in generation production cost savings to consumers. To the extent economic efficiency is enhanced through lower heat rates, CenterPoint Energy envisions there would be some environmental benefit as well.

6) Could there be any implications for grid reliability – positive or negative – from greater use of economic dispatch? If so, how should economic dispatch be modified or enhanced to protect reliability?

Response of CenterPoint Energy:

Generally, major events, such as the 2003 northeast U. S. blackout, the 2003 Italy blackout, and the 1996 western state blackouts, have large transfers of energy from remote generators to large load centers as a common characteristic. In addition, generally, the most reliable generation dispatch pattern is where generation is located in close proximity to large load centers, and this condition does not necessarily coincide with the most economic generation dispatch pattern. Theoretically, this issue could be addressed by siting new generation closer to the load centers. These issues were largely addressed by vertically integrated utilities, but are problematic in an unbundled environment. Moreover, this issue can also be addressed in theory through security constrained dispatch algorithms or methodologies and the use of Reliability Must-Run (RMR) generating units. These methods can and do help ensure reliability except under extreme (NERC transmission planning category D) type contingencies, which are rare events but can cause major, widespread outages when they occur. The planning requirements for NERC Category D events are vague (planners are required to evaluate risks and consequences) and operators are not required to operate securely under Category D conditions, so the performance differential under Category D conditions is easy to overlook.

Furthermore, it is unclear whether unbundled generators perform as well as vertically integrated utility generators performed from the standpoint of system reliability. In an environment where utilities operated integrated transmission systems, generators, and a control area, it was clear that the integrated utility was responsible for reliability, and there was no need for clear reliability performance standards for generators – utilities could integrate and coordination operations to ensure reliability using internal utility processes. In an unbundled industry environment, there is no single entity responsible for overall system reliability. Competitive entities naturally seek to minimize costs to remain competitive. With unclear and potentially inadequate reliability

standards and compliance mechanisms, there appears to be little or no economic rationale for premiums to be paid by generators for enhanced grid reliability, even when the premium is relatively small.

CenterPoint Energy believes ERCOT frequency performance has suffered as a result; this opinion was recently confirmed by an ERCOT subcommittee charged with monitoring reliability after reviewing analysis provided by one of its working groups. In addition, CenterPoint Energy believes excitation systems installed on some new generators do not perform as well as excitation systems previously installed on utility generators, largely due to the lack of clear excitation system performance standards and problematic performance monitoring and compliance efforts. The lack of clear excitation system performance standards is particularly troubling from the standpoint of system reliability when one additionally considers the lack of clear generator low-voltage ride-through standards. Generator excitation system performance is the key determinant of how fast system voltages recover from a low voltage excursion. Slow voltage recovery, combined with poor generator low-voltage ride through capability, is a risk to system reliability, particularly when large energy transfers are occurring and the system is more likely to experience low voltage excursions associated with tie-line or generator contingencies. The Federal Energy Regulatory Commission (FERC) has been trying to establish a low-voltage ride-through requirement for wind generators, but thus far has been unsuccessful in resolving the issue, in that FERC's proposal is limited to wind generators and would allow generators to trip before system faults can be cleared.

Notwithstanding these concerns, it makes sense to approximate economic generation dispatch as much as possible when planning transmission systems, for the reasons stated in previous responses. Failure to do so perpetuates transmission constraints and reliance upon contrived, uneconomic generation re-dispatch, which carries its own set of reliability, as well as economic, risks.